

What is claimed is:

1. An interference canceller apparatus that eliminates interference from an other user by generating an  
5 interference replica of the other user and subtracting the interference replica from a received signal, comprising:

hard deciding means for carrying out a hard decision on a signal after performing error correcting decoding  
10 on the received signal;

error detecting means for carrying out error detection on a signal after the hard decision; and

replica generating means for generating, when the error detection result shows that the signal after the  
15 hard decision is erroneous, the replica using a weighting factor to reduce the replica.

2. An interference canceller apparatus that eliminates interference from an other user by generating an  
20 interference replica of the other user and subtracting the interference replica from a received signal, comprising:

first hard deciding means for carrying out a hard decision on a signal after performing error correcting  
25 decoding on the received signal;

second hard deciding means for carrying out a hard decision on a signal before performing error correcting decoding on the received signal;

error detecting means for carrying out error detection on a signal after the first hard decision; and

replica generating means for generating, when the error detection result shows that the signal after the first hard decision is erroneous, the replica using a signal after the second hard decision.

3. An interference canceller apparatus according to claim 2, wherein said replica generating means generates, when the error detection result shows that the signal after the first hard decision is errorless, the replica using a signal obtained by carrying out error correcting coding on the signal after the first hard decision.

4. An interference canceller apparatus that eliminates interference from an other user by generating an interference replica of the other user and subtracting the interference replica from a received signal, comprising:

hard deciding means for carrying out a hard decision on a signal after performing error correcting decoding on the received signal;

soft deciding means for carrying out a soft decision on a signal before performing error correcting decoding on the received signal;

error detecting means for carrying out error detection on a signal after the hard decision; and

replica generating means for generating, when the

201537-01000

error detection result shows that the signal after the hard decision is erroneous, the replica using a signal after the soft decision.

5 5. An interference canceller apparatus according to claim 4, wherein said replica generating means generates, when the error detection result shows that the signal after the hard decision is errorless, the replica using a signal obtained by carrying out error correcting coding on the  
10 signal after the hard decision.

6. An interference canceller apparatus provided with a plurality of stages each for generating an interference replica of an other user and subtracting the interference  
15 replica from a received signal, with at least one stage except the final stage having an interference canceller unit, the interference canceller unit, comprising:

first hard deciding means for carrying out a hard decision on a signal after performing error correcting  
20 decoding on the received signal;

second hard deciding means for carrying out a hard decision on a signal before performing error correcting decoding on the received signal;

error detecting means for carrying out error  
25 detection on a signal after the first hard decision;

selecting means for selecting a most suitable signal to be used for replica generation from among a signal obtained by carrying out error correcting coding on the

2025-10-10 10:10:10

signal after the first hard decision in the own stage,  
a signal obtained by carrying out error correcting coding  
on the signal after the first hard decision in the previous  
stage, and a signal after the second hard decision in  
5 the own stage, based on the error detection result of  
the own stage and the error detection result of the previous  
stage; and

replica generating means for generating the replica  
using the selected signal.

10

7. An interference canceller apparatus according to claim  
6, wherein said selecting means selects, when the error  
detection result in the previous stage shows that the  
signal after the first hard decision in the previous stage  
15 is errorless, the signal obtained by carrying out error  
correcting coding on the signal after the first hard  
decision in the previous stage.

8. An interference canceller apparatus according to claim  
20 6, wherein said selecting means selects, when the error  
detection result in the previous stage shows that the  
signal after the first hard decision in the previous stage  
is erroneous and the error detection result in the own  
stage shows that the signal after the first hard decision  
25 in the own stage is errorless, the signal obtained by  
carrying out error correcting coding on the signal after  
the first hard decision in the own stage.

9. An interference canceller apparatus according to claim 6, wherein said selecting means selects, when the error detection result in the previous stage shows that the signal after the first hard decision in the previous stage is erroneous and the error detection result in the own stage shows that the signal after the first hard decision in the own stage is erroneous, the signal after the second hard decision in the own stage.

10. An interference canceller apparatus according to claim 6, wherein the final stage has a second interference canceller unit, the second interference canceller unit, comprising:

said first hard deciding means for carrying out a hard decision on a signal after performing error correcting decoding on the received signal;

second selecting means for selecting a signal to be used for output from among the signal after the first hard decision in the own stage and the signal after the first hard decision in the previous stage, based on the error detection result of the previous stage; and

outputting means for outputting the selected signal.

11. An interference canceller apparatus according to claim 10, wherein said second selecting means selects, when the error detection result in the previous stage shows that the signal after the first hard decision in

the previous stage is errorless, the signal after the first hard decision in the previous stage.

12. An interference canceller apparatus according to  
 5 claim 10, wherein said second selecting means selects, when the error detection result in the previous stage shows that the signal after the first hard decision in the previous stage is erroneous, the signal after the first hard decision in the own stage.

10

13. An interference canceller apparatus provided with a plurality of stages each for generating an interference replica of an other user and subtracting the interference replica from a received signal, with at least one stage  
 15 except the final stage having an interference canceller unit, the interference canceller unit, comprising:

hard deciding means for carrying out a hard decision on a signal after performing error correcting decoding on the received signal;

20 soft deciding means for carrying out a soft decision on a signal before performing error correcting decoding on the received signal;

error detecting means for carrying out error detection on a signal after the hard decision;

25 selecting means for selecting a most suitable signal to be used for replica generation from among a signal obtained by carrying out error correcting coding on the signal after the hard decision in the own stage, a signal

obtained by carrying out error correcting coding on the signal after the hard decision in the previous stage, and a signal after the soft decision in the own stage, based on the error detection result of the own stage and  
 5 the error detection result of the previous stage; and  
     replica generating means for generating the replica using the selected signal.

14. An interference canceller apparatus according to  
 10 claim 13, wherein said selecting means selects, when the error detection result in the previous stage shows that the signal after the hard decision in the previous stage is errorless, the signal obtained by carrying out error correcting coding on the signal after the hard decision  
 15 in the previous stage.

15. An interference canceller apparatus according to claim 13, wherein said selecting means selects, when the error detection result in the previous stage shows that  
 20 the signal after the hard decision in the previous stage is erroneous and the error detection result in the own stage shows that the signal after the hard decision in the own stage is errorless, the signal obtained by carrying out error correcting coding on the signal after the hard  
 25 decision in the own stage.

16. An interference canceller apparatus according to claim 13, wherein said selecting means selects, when the

20040327 00000000

error detection result in the previous stage shows that the signal after the hard decision in the previous stage is erroneous and the error detection result in the own stage shows that the signal after the hard decision in the own stage is erroneous, the signal after the soft decision in the own stage.

17. An interference canceller apparatus according to claim 13, wherein the final stage has a second interference canceller unit, the second interference canceller unit, comprising:

said hard deciding means for carrying out a hard decision on a signal after performing error correcting decoding on the received signal;

second selecting means for selecting a signal to be used for output from among the signal after the hard decision in the own stage and the signal after the hard decision in the previous stage, based on the error detection result of the previous stage; and

outputting means for outputting the selected signal.

18. An interference canceller apparatus according to claim 17, wherein said second selecting means selects, when the error detection result in the previous stage shows that the signal after the hard decision in the previous stage is errorless, the signal after the hard decision in the previous stage.



19. An interference canceller apparatus according to claim 17, wherein said second selecting means selects, when the error detection result in the previous stage shows that the signal after the hard decision in the previous stage is erroneous, the signal after the hard decision in the own stage.

20. A base station apparatus equipped with the interference canceller apparatus according to any one of claim 1 to claim 19.

21. A mobile station apparatus equipped with the interference canceller apparatus according to any one of claim 1 to claim 19.

22. An interference elimination method for eliminating interference from an other user by generating an interference replica of the other user and subtracting the interference replica from a received signal, comprising:

- a hard deciding step of carrying out a hard decision on a signal after performing error correcting decoding on the received signal;
- an error detecting step of carrying out error detection on a signal after the hard decision; and
- a replica generating step of generating, when the error detection result shows that the signal after the

hard decision is erroneous, the replica using a weighting factor to reduce the replica.

23. An interference elimination method for eliminating  
5 interference from an other user by generating an  
interference replica of the other user and subtracting  
the interference replica from a received signal,  
comprising:

20 a first hard deciding step of carrying out a hard  
decision on a signal after performing error correcting  
decoding on the received signal;

an error detecting step of carrying out error  
detection on a signal after the first hard decision; and

25 a replica generating step of generating, when the  
error detection result shows that the signal after the  
first hard decision is erroneous, the replica using a  
signal obtained by carrying out a hard decision on a signal  
before performing error correcting decoding on the  
received signal.

20

24. An interference elimination method according to claim  
23, wherein said replica generating step generates, when  
the error detection result shows that the signal after  
the first hard decision is errorless, the replica using  
25 a signal obtained by carrying out error correcting coding  
on the signal after the first hard decision.

25. An interference elimination method for eliminating

interference from an other user by generating an interference replica of the other user and subtracting the interference replica from a received signal, comprising:

- 5           a hard deciding step of carrying out a hard decision on a signal after performing error correcting decoding on the received signal;
  - an error detecting step of carrying out error detection on a signal after the hard decision; and
  - 10          a replica generating step of generating, when the error detection result shows that the signal after the hard decision is erroneous, the replica using a signal obtained by carrying out a soft decision on a signal before performing error correcting decoding on the received
  - 15          signal.
26. An interference elimination method according to claim 25, wherein said replica generating step generates, when
- 20          the error detection result shows that the signal after the hard decision is errorless, the replica using a signal obtained by carrying out error correcting coding on the signal after the hard decision.
27. An interference elimination method for an
- 25          interference canceller apparatus provided with a plurality of stages each for generating an interference replica of an other user and subtracting the interference replica from a received signal, whose at least one stage

except the final stage, comprising:

a first hard deciding step of carrying out a hard decision on a signal after performing error correcting decoding on the received signal;

- 5 a second hard deciding step of carrying out a hard decision on a signal before performing error correcting decoding on the received signal;

an error detecting step of carrying out error detection on a signal after the first hard decision;

- 10 a selecting step of selecting a most suitable signal to be used for replica generation from among a signal obtained by carrying out error correcting coding on the signal after the first hard decision in the own stage, a signal obtained by carrying out error correcting coding  
15 on the signal after the first hard decision in the previous stage, and a signal after the second hard decision in the own stage, based on the error detection result of the own stage and the error detection result of the previous stage; and

- 20 a replica generating step of generating the replica using the selected signal.

28. An interference elimination method according to claim 27, wherein said selecting step selects, when the error  
25 detection result in the previous stage shows that the signal after the first hard decision in the previous stage is errorless, the signal obtained by carrying out error correcting coding on the signal after the first hard

decision in the previous stage.

29. An interference elimination method according to claim  
27, wherein said selecting step selects, when the error  
5 detection result in the previous stage shows that the  
signal after the first hard decision in the previous stage  
is erroneous and the error detection result in the own  
stage shows that the signal after the first hard decision  
in the own stage is errorless, the signal obtained by  
10 carrying out error correcting coding on the signal after  
the first hard decision in the own stage.

30. An interference elimination method according to claim  
27, wherein said selecting step selects, when the error  
15 detection result in the previous stage shows that the  
signal after the first hard decision in the previous stage  
is erroneous and the error detection result in the own  
stage shows that the signal after the first hard decision  
in the own stage is erroneous, a signal obtained by carrying  
20 out error correcting coding on the signal after the second  
hard decision in the own stage.

31. An interference elimination method according to claim  
27, whose final stage, comprising:  
25       said first hard deciding step of carrying out a hard  
decision on a signal after performing error correcting  
decoding on the received signal;  
      a second selecting step of selecting a signal to

be used for output from among the signal after the first hard decision in the own stage and the signal after the first hard decision in the previous stage, based on the error detection result of the previous stage; and

- 5           an outputting step of outputting the selected signal.

32. An interference elimination method according to claim 31, wherein said second selecting step selects, when the error detection result in the previous stage shows that the signal after the first hard decision in the previous stage is errorless, the signal after the first hard decision in the previous stage.

15   33. An interference elimination method according to claim 31, wherein said second selecting step selects, when the error detection result in the previous stage shows that the signal after the first hard decision in the previous stage is erroneous, the signal after the first hard decision in the own stage.

34. An interference elimination method for an interference canceller apparatus provided with a plurality of stages each for generating an interference replica of an other user and subtracting the interference replica from a received signal, whose at least one stage except the final stage, comprising:

a hard deciding step of carrying out a hard decision

on a signal after performing error correcting decoding  
on the received signal;

5 a soft deciding step of carrying out a soft decision  
on a signal before performing error correcting decoding  
on the received signal;

an error detecting step of carrying out error  
detection on a signal after the hard decision;

10 a selecting step of selecting a most suitable signal  
to be used for replica generation from among a signal  
obtained by carrying out error correcting coding on the  
signal after the hard decision in the own stage, a signal  
obtained by carrying out error correcting coding on the  
signal after the hard decision in the previous stage,  
and a signal after the soft decision in the own stage,  
15 based on the error detection result of the own stage and  
the error detection result of the previous stage; and

a replica generating step of generating the replica  
using the selected signal.

20 35. An interference elimination method according to claim  
34, wherein said selecting step selects, when the error  
detection result in the previous stage shows that the  
signal after the hard decision in the previous stage is  
errorless, the signal obtained by carrying out error  
25 correcting coding on the signal after the hard decision  
in the previous stage.

36. An interference elimination method according to claim

34, wherein said selecting step selects, when the error detection result in the previous stage shows that the signal after the hard decision in the previous stage is erroneous and the error detection result in the own stage shows that the signal after the hard decision in the own stage is errorless, the signal obtained by carrying out error correcting coding on the signal after the hard decision in the own stage.

37. An interference elimination method according to claim 34, wherein said selecting step selects, when the error detection result in the previous stage shows that the signal after the hard decision in the previous stage is erroneous and the error detection result in the own stage shows that the signal after the hard decision in the own stage is erroneous, the signal after the soft decision in the own stage.

38. An interference elimination method according to claim 34, whose final stage, comprising:

said hard deciding step of carrying out a hard decision on a signal after performing error correcting decoding on the received signal;

a second selecting step of selecting a signal to be used for output from among the signal after the first hard decision in the own stage and the signal after the hard decision in the previous stage, based on the error detection result of the previous stage; and



39. An interference elimination method according to claim  
5 38, wherein said second selecting step selects, when the  
error detection result in the previous stage shows that  
the signal after the hard decision in the previous stage  
is errorless, the signal after the hard decision in the  
previous stage.

40. An interference elimination method according to claim 38, wherein said second selecting step selects, when the error detection result in the previous stage shows that the signal after the hard decision in the previous stage is erroneous, the signal after the hard decision in the own stage.